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WELLS, VARIATIONS IN THEIR DEPTH.

WE are very glad to receive in speedy response to the article in last month's Magazine two very complete sets of well measurements. Some of the prominent features we purpose to notice on the present occasion, and, to make our remarks still more clear, have laid the results down on the accompanying diagram. In the first place, it should be stated that for the Hartlip observations we are indebted to Mr. Bland, of New Place, and for those from Chilgrove, to Mr. Leyland Woods.

The first feature that demands attention is the excessive fluctuation in the depth at Chilgrove as compared with that at Hartlip; that at the former being *nine times as great* as that at Hartlip.

The month of least water at Chilgrove is September, at Hartlip it is December; and a still stronger contrast exists with reference to the month of fullest supply, which is November at Chilgrove, and June at Hartlip, the probable, if we may not say evident, cause, being the rapidity with which the chalk downs absorb the rain falling on them. Indications of this may be noted in almost every year of the Chilgrove observations, but the most striking illustration occurred at the close of the summer drought of 1865. This, it will be remembered, ended on October 8th; rain fell most heavily from the 19th to the end of the month, amounting altogether to 10 inches, or 2 inches more than in any other month in the 13 years. The well on October 8th contained less than 19 feet of water, on 26th it had 24 feet, on November 2nd 66 feet, and by the end of that month 105 feet. A moment's glance at the Hartlip curve will show that no such fluctuations occur there.

It has, we believe, been laid down that summer rains are of little moment to the hydraulic engineer; it does not become us lightly to controvert the dicta of practical men, yet some points do appear worth mentioning. And, first, Chilgrove; the rainfall in the winter 1855-56, and the winter of 1861-62, were nearly equal, the summer of the former year had about 19 inches, and the latter 15. At the commencement of the summer half 1856 the well had 54 feet, and at its close 30 feet—*decrease* 24 feet; in 1862 it started with 82 feet, and had only 30 feet left, the *decrease* being 52 feet, or twice as great as with the wetter summer of 1856. Again, the winter of 1852-53 was considerably wetter than the winter of 1859-60, but the summers were the reverse. The *very* wet winter 1852-3, and wet summer of 1853 did not produce so much water by one-seventh as the wet winter 1859-60, and *very* wet summer of 1860. At Hartlip there seems even a stronger proof that summer falls are not to be ignored. The winters of 1828-29

and 1829-30 were remarkably dry, and the summers as noticeably wet—but as is immediately seen from the diagram, the loss of nearly half the usual winter supply was insensible, being, we suppose, fully made up by summer falls, and the well was rather fuller than usual.

Of course, we by no means ignore the normal dependence of *all* sources of water-supply on the rainfall of the colder months, but it appears that the summer rain must also be carefully watched. It occurs to us—and we give the suggestion for what it is worth, and no more—that possibly the elevation of water (even from great depths) by natural capillary action may far exceed in amount anything of which we have any idea; if so, then we at once see why wet summers are so beneficial to the supply of well-water, for they not only add a little to the winter's stores, but also prevent

DEPTH OF WATER IN WELL AT NEW PLACE, HARTLIP, SITTINGBOURNE.

YEAR.	1819.	1820.	1821.	1822.	1823.	1824.	1825.	1826.	1827.	1828.	1829.	1830.	Mean
	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.
Jan. ...	10 0	6 7	6 3	6 10	7 3	7 0	17 3	10 6	9 6	8 4	9 8	13 10	9 5
Feb. ...	9 9	8 0	7 6	9 1	7 10	7 6	19 0	11 0	9 10	11 7	9 4	14 6	10 5
March	10 0	9 6	8 3	9 11	9 5	8 3	20 0	11 3	10 1	13 4	9 1	15 9	11 3
April .	10 9	9 6	8 9	10 1	10 9	9 0	20 4	11 6	11 0	14 3	9 3	16 7	11 11
May ...	10 9	9 0	9 0	10 2	11 9	10 0	20 0	11 6	11 3	14 6	9 6	17 2	12 1
June...	10 6	8 10	9 6	10 12	0 12	2 19	6 11	4 11	2 14	6 10	7 17	4 12	3
July ...	10 0	8 3	9 3	9 9	12 0	14 0	18 0	10 9	10 6	14 2	10 16	10 12	0
Aug. ...	9 6	7 4	8 6	8 8	11 9	13 6	16 6	9 10	9 8	13 7	10 9	16 0	11 4
Sept. ...	8 6	7 0	7 10	7 10	10 9	13 0	15 8	8 10	8 8	12 7	10 4	11 10	6
Oct. ...	8 0	6 6	6 10	7 3	10 12	6 14	0 7	9 8	1 12	0 10	10 13	9 9	10
Nov. ...	7 0	5 10	6 3	6 10	8 9	13 0	13 0	7 9	7 6	11 0	12 3	12 10	9 4
Dec. ...	6 6	5 10	5 10	6 6	8 0	14 3	11 6	8 2	7 5	10 2	13 2	12 5	9 2
MEAN.	9 3	7 8	7 10	8 7	10 1	11 2	17 1	10 0	9 7	12 6	10 6	15 2	10 10

Brim 157 feet 9 inches above sea; well sunk through plastic clay and chalk. Depth to water, 130 ft.; mean depth of water, 10 ft 10 in.; greatest observed depth in April, 1825, 20 ft. 4 in.; least (in November and December, 1820), 5 ft. 10 in.; variation, 14 ft. 6 in. Recent measurements give for the minimum, 1 ft. in January, 1860, during which wet year it rose to 11 ft. 6 in. by October, or 1 foot above the average of the above period.

RAINFALL AT GREENWICH OBSERVATORY. Height above Ground, 6in.
Above Mean Sea Level, 155ft.

YEAR	1819	1820	1821	1822	1823	1824	1825	1826	1827	1828	1829	1830	Mean
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
Jan. ...	2·3	1·9	2·4	·6	1·5	1·0	1·1	·3	1·2	4·3	·4	1·7	1·56
Feb. ...	3·0	·6	·0	1·1	3·5	2·5	1·0	1·9	·7	1·1	1·3	2·5	1·60
March.	1·8	1·5	3·9	1·5	1·5	1·9	1·4	1·9	2·6	1·0	·7	·3	1·67
April..	3·1	1·6	2·0	2·9	2·0	2·1	2·0	1·1	1·3	2·4	4·8	3·2	2·38
May ...	3·3	4·0	2·4	2·1	·8	4·2	3·3	2·7	2·6	1·7	·6	2·2	2·49
June...	2·5	2·3	2·4	·9	1·2	3·8	·8	1·1	·7	2·2	1·7	2·6	1·85
July ...	2·2	4·8	3·1	4·5	3·6	2·0	·1	2·6	1·4	7·0	4·2	1·9	3·12
Aug. ...	·4	1·9	2·1	2·0	3·0	4·4	2·7	1·9	1·2	4·2	4·5	3·9	2·68
Sept. ...	3·4	2·4	3·7	1·5	1·0	3·5	2·8	3·4	3·9	2·6	3·6	3·5	2·94
Oct. ...	2·3	2·9	2·6	4·0	4·4	2·6	3·0	1·9	4·4	1·5	1·9	·8	2·69
Nov. ...	3·0	2·0	4·7	4·1	1·8	4·3	3·2	2·8	1·3	1·0	1·4	3·4	2·75
Dec. ...	3·8	1·8	5·2	2·5	2·8	4·0	3·2	1·4	3·6	2·5	·1	1·2	2·67
TOTAL	31·1	27·7	34·5	27·7	27·1	36·3	24·6	23·0	24·9	31·5	25·2	27·2	28·40

the constant drain of evaporation from the surface of the ground ; and, if our theory be worth anything, not *only* from the surface but also from the uniformly moist ground beneath, down, we know not how far.

It will be seen that the depth of water at Hartlip is shown twice, once on the same scale as that at Chilgrove, for comparison therewith, and once on a more open scale, to show the monthly variations. The isolated observations in 1858-59-60 are very interesting, as showing how slight (if any) is the permanent lowering of the water at that place.

The abstracts are mainly interesting as indicating that, from our rainfall observations when fully analyzed, we may hope to determine the amount of water stored in the earth at any date for nearly 200 years, and even the level at which it would stand.

DEPTH OF WATER IN WELL AT CHILGROVE, CHICHESTER.

Well situated in a valley of the Chalk Hills—brim about 266 feet above Sea Level, the hills on three sides rise from 200 to 500 feet above it.

YEAR.	1853	1854	1855	1856	1857	1858	1859	1860	1861	1862	1863	1864	1865	Mean 13 yr.
	ft.	ft.	ft.	ft.	ft.	ft.	ft.	ft.	ft.	ft.	ft.	ft.	ft.	ft.
Jan. ...	135	65	x	76	71	38	11	107	93	57	95	59	32	65
Feb. ...	80	60	x	75	59	39	36	91	65	61	81	62	67	60
March.	60	48	11	56	51	40	36	60	66	96	59	90	69	57
April	50	38	15	54	47	40	35	53	66	82	43	59	50	49
May ...	52	30	18	44	40	35	35	50	50	60	33	46	38	41
June...	43	24	18	41	32	31	36	83	37	48	30	35	31	38
July ...	40	18	16	39	26	25	25	64	29	38	27	30	25	31
Aug. ...	40	15	13	31	21	21	20	65	24	31	23	23	20	27
Sept. ...	49	14	11	26	17	17	15	65	21	25	19	16	19	24
Oct. ...	98	13	19	30	25	13	14	84	18	30	23	14	45	33
Nov....	84	x	44	31	33	11	38	85	40	42	37	12	105	78
Dec. ...	54	x	39	62	38	10	76	100	70	65	59	16	91	53
Mean..	65	28	18	47	38	27	31	76	48	53	44	39	49	43

NOTE.—Previous to February, 1855, the well was only 135 ft. deep, subsequently it was 145 ft., the 10 ft. has been added to the first two years' measurements, so as to secure uniformity; there was no water at 135 ft. in the four months x x x x, but it probably was considerably above the base line of 145 ft. In taking the means 8 ft. has been assumed for each of those months. Mean depth of water 43 ft., greatest observed depth (in Jan., 1853) 135 ft., least (in the winter of 1855) 8 ft? variation 127 ft. In Jan., 1866, it rose to 143 ft., which would raise the variation to 135 ft.

RAINFALL AT CHILGROVE. Height above Ground, 6in. Above Mean Sea Level, 284 ft.

YEAR.	1853	1854	1855	1856	1857	1858	1859	1860	1861	1862	1863	1864	1865	Mean
Jan. ...	5.00	3.17	.70	4.05	2.98	1.65	2.44	4.34	.78	3.21	3.95	2.06	4.35	2.98
Feb. ...	1.10	.80	1.50	1.35	.43	1.03	2.21	1.50	2.08	.75	.94	1.48	2.60	1.37
March.	2.07	.42	2.95	1.25	2.20	1.66	1.88	2.18	2.96	3.99	1.21	3.39	1.26	2.11
April .	3.45	.16	.45	3.86	2.11	2.67	3.27	1.75	.76	1.13	.57	1.48	.43	1.70
May ...	2.25	3.92	2.95	3.83	1.35	2.40	1.23	3.85	1.55	3.55	2.35	1.60	2.89	2.59
June ..	2.49	1.90	1.30	2.21	2.30	.99	1.30	6.72	2.34	2.60	4.52	1.33	2.27	2.48
July ...	6.47	.85	4.50	.79	1.51	2.95	3.08	2.88	4.81	2.74	.89	.38	2.44	2.64
Aug....	3.46	1.35	1.32	4.29	2.42	2.57	1.74	5.05	.73	2.39	1.99	1.04	5.49	2.60
Sept...	3.61	1.20	2.70	4.20	4.72	2.56	4.35	3.86	3.94	2.24	4.20	4.26	.30	3.24
Oct. ...	5.97	4.02	7.20	3.22	7.83	2.20	4.15	2.86	1.81	5.17	4.33	1.88	9.95	4.66
Nov. ...	1.60	1.85	1.70	1.04	2.08	1.75	5.04	3.60	4.99	1.45	2.24	4.35	3.50	2.70
Dec. ...	.65	2.17	1.69	2.88	1.31	3.43	3.57	3.41	1.92	3.13	3.26	1.42	2.97	2.45
TOTAL	38.12	21.81	28.96	32.97	31.24	25.86	34.26	42.00	28.67	32.35	30.45	24.67	38.45	31.52

RAINFALL IN APRIL, 1866.

Div.	STATIONS. [The Roman numerals denote the division of the Annual Tables to which each station belongs.]	HEIGHT OF GAUGE.		DEPTH OF RAIN.				Days on which .01 or more fell.
		Above Ground	Above Sea Level.	Total Fall.	Difference from average 1860-5	Greatest Fall in 24 hours.		
						Depth.	Date.	
		ft. in.	feet.	inches.	inches.	inches.		
I.	Camden Town	0 6	100	1.76	+ .63	.74	28	13
II.	Staplehurst (Linton Park)	0 6	200 ?	2.09	+ .87	.53	29	16
III.	Selborne (The Wakes).....	4 0	500 ?	2.78	+ 1.28	.49	28	15
IV.	Hitchin	2 0	240	1.65	+ .65	.76	29	14
V.	Banbury	7 0	345	1.52	+ .36	.75	28	14
VI.	Wisbech.....	0 6	10	1.69	...	.57	28	9
VII.	Bury St. Edmunds (Culford)	1 2	...	1.85	+ 1.10	.46	28	12
VIII.	Calne	0 11	250	2.17	...	.67	28	19
IX.	Plymouth (Goodamoor)	0 2	580	2.98	+ .73	.56	11	15
X.	Barnstaple	0 6	31	1.46	— .55	.35	12	13
XI.	Taunton (Fulland's School)	1 4	...	1.91	+ .37	.53	29	13
XII.	Shrewsbury (Highfield)	5 6	200	.68	— .66	.24	12	9
XIII.	Tenbury (Orleton)	0 9	200	1.69	+ .15	.35	12	18
XIV.	Leicester (Wigston)	0 6	220	1.31	+ .01	.25	6	13
XV.	West Retford	0 6	50	1.27	+ .26	.27	2	13
XVI.	Derby	5 0	180	1.04	— .39	.43	1	14
XVII.	Manchester	2 7	106	.30	— 1.46	.08	20 & 27	6
XVIII.	York	0 6	50	1.05	— .05	.33	3	11
XIX.	Skipton (Arncliffe)	3 0	750	2.01	— 1.03	.43	1	12
XX.	North Shields	1 0	124	1.47	+ .16	.31	1	13
XXI.	Borrowdale (Seathwaite).....	1 0	422	5.97	— .93	1.18	16	15
XXII.	Abercarn	1 3	450	3.30	...	.84	28	17
XXIII.	Haverfordwest	2 0	60	2.21	+ .35	.64	28	10
XXIV.	Rhayader (Cefnfaes).....	2 0	880	1.33	+ .56	.30	28	15
XXV.	Llanberis (R. Victoria Hotel)	1 0	370	5.42	...	2.92	2	13
XXVI.	Dumfries	0 5	70	.96	— .71	.21	19	12
XXVII.	Hawick (Silverbut Hall)	4 0	512	2.22	...	.54	2	17
XXVIII.	Ayr (Auchendrane House)	2 3	94	.77	— 1.46	.22	15	10
XXIX.	Otter House	0 6	130	2.30	— .45	.55	20	11
XXX.	Leven (Nookton)	0 6	80	1.45	+ .20	.34	19	13
XXXI.	Stirling (Deanston)	0 0	130	2.11	+ .36	.86	16	14
XXXII.	Logierait	1 0	250	1.49	...	.34	16	11
XXXIII.	Ballater	0 10	656	2.06	...	.48	1	18
XXXIV.	Aberdeen	4 8	115	1.62	...	.63	19	16
XXXV.	Inverness (Culloden)	3 0	104	1.01	...	.41	2	9
XXXVI.	Fort William	0 8	20	3.79	...	1.32	16	14
XXXVII.	Portree	0 4	60	3.80	— 1.47	1.02	19	12
XXXVIII.	Loch Broom	0 8	48	2.59	...	.40	1	16
XXXIX.	Helmsdale	1 0	34	1.49	...	.46	28	19
XL.	Sandwick	2 0	78	1.21	— .53	.38	20	13
XLI.	Cork	6 0	65	3.62	...	1.19	26	21
XLII.	Waterford	4 0	60	2.41	+ .18	.54	26	19
XLIII.	Killaloe	5 0	128	2.05	— .08	.40	13	16
XLIV.	Portarlinton	9 0	236	1.64	— .38	.31	5	20
XLV.	Monkstown	0 6	100	2.11	+ .47	.52	4	17
XLVI.	Galway	6 0	25	2.22	...	.46	15	18
XLVII.	Bunninadden (Doo Castle)	1 0	...	1.65	...	.29	18	15
XLVIII.	Bawnboy (Owendoon)	1 3	218 ?	2.24	...	.36	18	20
XLIX.	Waringtown	0 4	191	.98	...	.16	11	13
L.	Strabane (Leckpatrick)	0 5	260	1.26	...	.33	18	14

+ Shows that the fall was above the average ; — that it was below it.

METEOROLOGICAL NOTES ON THE MONTH.

ABBREVIATIONS.—Bar. for Barometer; Ther. for Thermometer; Max. for Maximum; Min. for Minimum; T for Thunder; L for Lightning; and TS for Thunderstorm.]

ENGLAND.

CAMDEN TOWN.—Hail at 0.20 p.m. on 14th; lunar halo on 27th; currant in blossom on 19th; cherry on 25th; chesnut in leaf on 23rd; vine on 24th; first butterfly on 25th. Max. 79°·4; in sun, 120°·3 on 27th; min. 33°·8 on 30th.

LINTON PARK.—First fortnight wet; the latter fine, with the exception of the 29th. The whole month mild, there being frost only on two mornings, while on the 27th the thermometer was 80° in shade. L on 7th, 10th, 11th, and 14th. Vegetation advanced rapidly between the 20th and 29th, but the ground very cold and bad for tillage. Cuckoo heard on the 11th; some say one day sooner, which is earlier than usual.

SELBORNE.—Rapid change of temp. from 26th to 30th. Hailstorms on 4th, 14th, and 20th. Aurora on 2nd and 5th. Max. temp. 65°·5 on 27th; min. 27°·5 on 5th. Cuckoo first heard on 12th; nightingale on 17th; swallows seen on 15th.

BANBURY.—Hail on 5th and 29th; aurora, 11th. Max. temp. 75° on 27th; min. 28° on 30th. Cuckoo on 20th; swallows on 13th; apple in bloom on 27th.

WISBECH.—Max. 77°·4 on 27th; min. 32° on 30th. Hail on 5th and 30th; L on 2nd and 14th. Swallow on 13th; pear in bloom on 22nd; apple on 25th; field elm in leaf, 21st; wych elm, 23rd; lime, 25th; sycamore, 26th; walnut, 28th.

CULFORD.—First half of month showery, second, fine. 26th, 27th, and 28th unusually warm, the max. being respectively 70°, 76°, and 68°, while the 29th and 30th were cold, the wind being east, and max. only 51° and 48° respectively.

GOODAMOR.—Max. temp 66°; min. 28° on 30th. Strong E. wind on 23rd, doing much damage to trees and buildings. Cuckoo heard and swallows seen on 16th; swift seen on 26th. L on 6th.

ORLETON.—Temp. very variable, but above the average. Max. 71°·5 on 27th; min. 30° on 30th. Grass min. below 32° only on 3 nights. On 28th, a sudden change from heat to cold. Cuckoo heard on 19th; first swallow seen on 13th; white-throat and willow wren on 21st. A few flakes of snow on 30th.

WIGSTON.—Season rather more forward than usual, as shown by the hawthorn and deciduous trees, and the unusually early appearance of the swallow, and sound of the cuckoo. Max. temp. 81°·5 on 27th; higher than I have ever known in April. Min. 26° on the 29th.

WEST RETFORD.—T and L on 14th; slight snow on 30th. With a few exceptional days, this has been a dull, cold month, the wind having been chiefly E., N.E., and N. Max. temp. 74° on 27th; min. 23° on 30th. Vegetation very backward, owing to the generally cold weather, and insufficient rainfall.

MANCHESTER.—The unusually small rainfall of April has, no doubt, been caused by the great prevalence of north-east winds, the black bulb in vacuum recorded 126°·8 on the 27th, a very high reading for April.

ARNcliffe.—Rainfall considerably below the average. A long prevalence of E. winds, and a backward spring. Max. temp. 64° on the 27th; min. 25° on 4th.

NORTH SHIELDS.—Hail on 1st, 14th, and 29th. Snow on 1st, 2nd, 3rd, and 30th. White rock cress in flower on 1st; Jerusalem cowslip on 8th.

SEATHWAITE.—More than 1 in. of rain on 2 days. East winds, with excessive hygroscopic dryness. At Tarnbank on 26th, at 3 p.m., dry bulb, 71°·0; wet bulb, 56°·2; diff. 14°·8. Evap. in 24 hours = 410 in. On morning of 30th, min. at 4 feet, 26°·9 and on grass 16°·4.

WALES.

ABERCARN.—The month has been generally dry, but cold; the alternations of temp. being sudden and frequent.

HAVERFORDWEST.—On the whole, a fine month; air generally cold, but with frost only on the 3rd, 29th, and 30th. Vegetation forward; the dry weather from the 16th to the 27th enabled the farmers to complete their sowing, which had been much retarded by the wet, and late cold of the winter. There was much high wind, but no heavy gale. A warm period occurred about the 26th and 27th, followed by a sudden fall of temp. to the end of the month. Max. 70°·5; min. 29°. A splendid meteor about 4 a.m. on the 12th; it appeared like a ball of white luminous matter, and burst into a series of stars like a sky-rocket, and disappeared.

CEFNFAES.—A dry April; parching winds from the N.E. prevailing during the month; and, at the end, all springs and sources of water very low. Cuckoo heard on the 16th, and corncrake on 29th. Max. 65°; min. 27°.

SCOTLAND.

DUMFRIES.—Showers on the 1st and 2nd; thence to the 10th, frosts at night, and cold, withering east winds by day. The next week mild and showery, vegetation making much progress. From the 20th to the close, weather dry, except on the 27th. Sowing completed under favourable circumstances in the beginning of the month, the oat and barley braids looking fresh and vigorous, but the dry and frosty weather towards the close of the month checked the growth of the grass. On 30th, the fruit-trees in blossom (especially pears and plums) were much injured by the frost. Cuckoo heard on the 19th. On the last of the month the *winter* snows had not disappeared from the hollows of the Wamphray hills. Max. 75°·5 on 27th; min. 28° on 4th; T on 27th.

HAWICK.—Snow on the 1st, 2nd, and 30th. Swallows first seen on 29th. First half of month very cold, wet, and windy, and agricultural operations almost at a stand-still; the latter half fine, except the last two days.

AUCHENDRANE.—Rainfall in April, 1861 = '61; in 1865 = '67; 1866 = '77; min. below 32° on 7 nights, on grass on 15 nights. The early potatoes, and plum tree blossoms, injured by the frosts of the 29th and 30th. On 26th, max. in sun 101°, in shade 69°; humidity at 2.45 p.m. only 35°; evap. from a water surface, 5 inches in diameter, amounted to '25 in 24 hours.

OTTER HOUSE.—Rain more or less from the 11th to the 21st—none before or after. TS on 19th. Frost on 3rd, 5th, 29th, and 30th. Weather favourable for agricultural operations, though rain is rather wanted. The cuckoo's welcome note was *heard* on 26th, and they are generally seen a fortnight before they are heard.

FORT WILLIAM.—N.E. winds from the 1st to the 11th, then S.W. to 15th, when it blew a gale; and N.E. again at the end of the month.

NOOKTON.—Cold and ungenial. Min. 27°·4 on 30th.

DEANSTON.—T on 13th and 14th. *Very dry* and sunshiny from 23rd to 26th. Cold, with hard frost on the 29th and 30th, min. on grass 24° and 21° respectively. Max. in shade 64°·5 on 26th, min. 25° on 4th.

LOGIERAIT.—Cold E. winds throughout the month. From the 20th, onwards, there has been great warmth and sunshine during the days, but frost and cold E. wind during the nights; the rainfall was confined to the 10th to 19th, there being only two other days (the 26th and 30th) on which any fell, and that of the 30th was only '01, and chiefly from snow.

BALLATER.—Temp. very changeable, ranging from 20°·5 on 1st, and 22°·5 on 30th to 71°·7 on 27th; the week preceding the 27th remarkably fine, but the month closed very stormy and cold. Ice $\frac{3}{8}$ -of-an-inch thick on water on the 30th. Four rainbows were observed, a magnificent double one on the 13th, not rising higher than the hill tops at 2 p.m.; several peals of thunder were heard on that day.

ABERDEEN.—Hail on 2nd to 5th, 17th, 19th, 28th, and 29th; fog on 10th, 11th, 12th, 25th, 26th, and 27th. Max. 75°·3 on 25th; min. 29°·5 on 30th; 21° on grass. A cold, raw month, but very quiet—no gale.

PORTREE.—The month, on the whole, has been cold, although the amount of sunshine has been above the average. Mean. temp. of month, 46°·1. Min. in shade 25°·4; on grass 15°·8 on 29th. No gales during the month, but very squally from the 13th to 16th, with heavy hail showers. Max. in shade 67°·0 on 25th and 26th. Cattle and sheep very weak from the heavy rains of the first three months of the year, but otherwise healthy.

LOCHBROOM.—The month, on the whole, has been a cold, dry one; the spring unfolding slowly, but gradually, until the 22nd, when the most beautiful weather burst upon us all at once till the 27th, when a most sudden and unwelcome change took place. Snow, intense cold, and hail as large as grape shot became the order of the day to the end of the month.

HELMSDALE.—Since the 26th the weather very cold. Snow, 4½ inches deep, fell on the morning of the 29th.

SANDWICK.—The month has been dry and cold; temp. 1°·4 below the mean. Ground sprinkled with snow on 2nd, 29th, and 30th; two peals of thunder on 13th; aurora on 5 nights; the prevalent direction of the wind was evidently the cause of the cold and dryness, it being N.N.E. and S.E. 19½ days.

I R E L A N D.

MONKSTOWN.—Gale on the 2nd; severe one on 16th; the first part of the month rather wet, rain having fallen almost every day, though only in small quantities. In the middle of the month the temp. was high, but the last few days were bitterly cold and harsh. Snow on the 29th, which continued lying on the mountains. Prevailing wind, easterly; it having ranged from N.E. to S.E. on 21 days; frost on the grass on several nights; temp. below 32° on 6 nights. Min. 27° on 4th; max. 66° on 21st. Vegetation fairly forward; gooseberries, currants, and wall-fruit in most cases being well formed.

DOO CASTLE.—T on 30th. No growth of any consequence this month; farming operations in a very backward state; cold N.E. winds for the last eight days, destructive of all growth.

OWENDOWN.—Hail on 1st and 30th; 2 in. of snow on 2nd, rather wet till 19th, then fine to 27th; cold to the close. Vegetation and spring work very backward. Swallows on 14th, cuckoo on 18th.

WARINGSTOWN.—Cold and ungenial, with easterly winds till the 12th; stormy and unsettled to 18th; then 10 days of fine seasonable weather, followed by two intensely cold days, and a most damaging frost on the night of the 29th, on which the min. was 26°. Frost on grass on 8 nights.

LECKPATRICK.—Very dry month; cold, parching easterly winds being prevalent. The rainfall less than in any April for 5 years; but, owing to the great fall during the previous months, the total fall for this portion of the year exceeds that of any previous one during that period—1862 = 14·01; 1863 = 10·04; 1864 = 10·69; 1865 = 13·23, and this year = 15·33.

GALE OF FEBRUARY 11TH, 1866.

Want of space prevented that earlier special notice of this gale which its local violence fully required. At all English stations, and the two Irish ones quoted herein, the lowest reading of the barometer in the month was on the 11th; and, therefore, the following readings are not only the minima of the gale, but also of the month.

BAROMETER REDUCED TO SEA LEVEL ON FEBRUARY 11TH.

STATION.	COUNTY.	Bar. at 9 a.m.	Lowest Reading and hour of occurrence.	Decrease.
		inches.	inches.	inch.
Waterford	Waterford	28·91		
Dublin	Dublin	28·89		
Kendal	Westmoreland	28·97		
N. Shields	Northumberland	28·82		
York	York	28·80		
Pentyrch, Cardiff	Glamorgan	28·85	28·55 at 5 p.m.	·30 (a)
Llanfrechfa, Newport	Monmouth	28·93	28·52 at 3 p.m.	·41
Boyce Court, Dymock	Gloucester	28·12	at 3 p.m.	(b)
Belgrave, Sidmouth	Devonshire	28·58	at 1 p.m.	
Holford, Bridgewater	Somerset	28·70		(c)
Bath	"	28·50		
Banbury	Oxford	28·48	at 5 p.m.	
Ryde, Isle of Wight	Hampshire	29·06	28·73 at 2 p.m.	·33
Reading	Berkshire	28·48		(d)
Eton	Buckinghamshire	29·16	28·61 at 5 p.m.	·55
Betchworth	Surrey	28·62		
Camden Town	Middlesex	29·25	28·61 at 4½ p.m.	·64 (e)
Dover	Kent	29·10		
Sudbury	Suffolk	28·54		
Wisbech	Cambridge	28·71		
Mattishall, E. Dereham	Norfolk	28·54	in aftern.	

(a) Bar. never so low before. No gale here.—(b) Not reduced to Sea Level. The calmest day this year.—(c) Gale from S. to N.W.—(d) Terrific gale.—(e) Heavy gale all the afternoon, with rain.

REMARKS.—*Ryde*.—On the 11th, a violent storm commenced about 4 a.m.; wind, S.S.W.; from 12 to 3, wind W.S.W., and blowing a complete hurricane. From 2 to 3 it raged with great fury. Large trees were blown down in all parts of the island, to the number of above 800; stacks of chimneys, tiles, slates, lead and zinc roofing torn away like paper, and many other damages. Two or three vessels at the Motherbank broke from their anchors, and one drifted on the Woolsiness, and was lost, with all hands. It is now thirty years since Ryde was visited with such a terrible hurricane, and that occurred on the 29th Nov., 1836. *Camden Town*.—Lowest barometer for at least 10 years; next lowest, 1859, December 26th, 6 a.m., 28·629 inches. *Mattishall*.—Lowest reading for 4 years, and though windy and wet, the weather was by no means commensurate with such an extraordinary depression.

The gale was very violent and destructive at Truro, Falmouth, Penzance, St. Ives, Poole, Portsmouth, Selborne, London, Chatham, and Yarmouth (Norfolk). Less violent, but still a high wind at Goodamoor, Calne, Taunton, W. Retford; did not reach the Northern Counties, Scotland, or Ireland, at all.

At Rouen the gale was very violent, and blew a train of empty carriages over the blocks, and on to the main-line, on which a train from Paris met and smashed eight of them. At Antwerp (as in several parts of England) the gale was accompanied by a heavy thunderstorm, and the waters of the Scheldt became so rough that two vessels were wrecked.

The Board of Trade reported—"The gales of Saturday night, 10th, and Sunday, 11th, were of unusual violence, and appear to have been most severely felt on our southern coasts. The disturbance seems to have partaken, in some degree, of a cyclonic character. It seems probable that the area of least pressure, or centre of the storm, passed in an easterly direction, not very far to the northward of London."

It will at once be seen that the above minima, although remarkably low for the south of England, are greatly above those given by Mr. Cunningham (*Met. Mag.* p. 16) for the Scottish stations on December 31st, 1865. The path of the storm seems to have been somewhat similar to that of the Royal Charter storm, with less N. in its direction, and rather to the S. of that celebrated track.

ARRIVAL OF BIRDS.

From the reports on pages 31 to 33, and others, we find the dates to have been—*Cuckoo*—11th at Linton Park; 12th at Selborne; 14th at Hillington, Lynn (Norfolk); 16th at Goodamoor and Rhayader; 18th at Owendoon; 19th at Killingholme, Ulceby, (Lincoln,) Orleton, and Dumfries; 20th at Banbury; 21st at Halifax; and 26th at Otter House.

Swallows on 13th at Orleton and Wisbech; 14th at Killingholme and Owendoon; 15th at Selborne; 16th at Goodamoor; 19th at Dublin; 29th at Hawick.

EQUIVALENT EXPRESSIONS OF WIND FORCE.

It has been suggested as desirable that the terms originally coupled with the sea scale 0—12 should be given. They are—

0 Calm.	3 Gentle Breeze.	6 Strong Breeze.	9 Strong Gale.
1 Light Air.	4 Moderate Breeze.	7 Moderate Gale.	10 Whole Gale.
2 Light Breeze.	5 Fresh Breeze.	8 Fresh Gale.	11 Storm.
			12 Hurricane.

LATEST INTELLIGENCE.

DUMFRIES.—On night of May 1st, a heavy fall of snow on the hills, being very deep on the mountain ranges round Moffat.

HELMSDALE.—Snow on May 1st, very trying for the lambs.

DUBLIN.—May 1st, a heavy fall of snow, and hail on 2nd.

The Cleveland hills, the moors, and the highest wolds in Yorkshire were covered with snow on the 1st, 2nd, and 3rd.

At Barton Seagrave, near Kettering, the min. in air on the 4th, was 23°·2. At Camden Town the air temperature did not fall below freezing point, but the grass temp. fell to 25°·5.